

Chapter 2

The Integration of Futures Markets

CONTENTS

	<i>Page</i>
FUTURES MARKETS TODAY	69
REGULATION OF FUTURES MARKETS	71
THE OPERATION OF FUTURES MARKETS * . . . * * * . + *	72
ISSUES RELATED TO PIT TRADING	73
Audit Trails " +	73
Dual Trading * . + * * * . +	74
INNOVATIONS IN FUTURES CONTRACT'S	75
STOCK-INDEX FUTURES ~ . . . " + Q	76
THE USES OF STOCK-INDEX FUTURES +	78
THE DEBATE ABOUT STOCK-INDEX	80
MARGINS	84
PREPARING FOR THE FUTURE	88

Figure

<i>Figure</i>	<i>Page</i>
4-1. Futures Contracts Traded by Commodity Group	71

Table

<i>Table</i>	<i>Page</i>
4-1. Incentives for Using Stock-Index Futures	78

The Operation of Futures Markets

A futures contract is a standardized agreement to buy or sell a specific amount of a commodity (now including financial instruments) at a specified price on delivery at a future date. The contract creates an *obligation* of the buyer to purchase, and the seller to sell, the underlying commodity. This report focuses particularly on one kind of futures contract—stock-index futures¹—because of its importance to securities markets and to current public policy issues.

The origins of futures contracts go back to “forward sales” in the grain markets of the Middle Ages, but futures contracts in the United States began in the 19th century.² The grain trade, essential to an agrarian economy, suffered from cycles of shortages and surpluses because of weather or other variable conditions. These caused sharp price fluctuations at harvest time. Both farmers and grain merchants wanted to reduce the uncertainty about the prices they might receive or pay when crops were brought to the market. Merchants therefore began to use ‘forward contracts,’ pledges to buy or sell grain to be delivered in the future.

Forward contracts were unreliable in that they were not standardized as to the quality of the commodity or as to delivery terms. Commitments by contracting merchants were sometimes abandoned. To remedy this, 82 businessmen formed the first organized futures exchange in the United States in 1848, the Chicago Board of Trade (CBOT).³ Chicago rapidly developed into a center of the grain market.

Beginning in 1865, futures contracts were standardized and cash bonds, or initial margin payments,

were required to ensure that contractual commitments would be met. Clearinghouses were created to match and verify trades and guarantee the fulfillment of each contract. The basic structure of today’s futures markets had come into being.

FUTURES MARKETS TODAY

Sixteen exchanges in the United States are authorized to trade futures contracts.⁴ Futures markets and futures exchanges are synonymous in the United States. There is no competition from an over-the-counter market, or from proprietary trading systems, as there is for securities exchanges.

Futures contracts need not, and now usually do not, involve any intention to make or take physical delivery of the underlying commodity, whether it be grain, foodstuffs, metals, corporate stocks, or foreign currencies. Less than 1 percent of futures contracts of any kind are now settled by delivery of the underlying commodity.⁵ When one buys a December futures contract in September, (e.g., in wheat, metal, or some other commodity), one agrees to pay a specified price in December. The buyer can satisfy this obligation either by receiving and paying for the commodity or by ‘offsetting’ the obligation, that is, by selling a December futures contract.

Each futures contract is now standardized with respect to quantity, quality, and month of expiration. The trading is conducted by intermediaries (floor brokers) for customers and by “locals” or floor traders, trading for themselves, on the floor of a

¹This futures contract covers the basket of stock counted in a market index such as the Standard & Poors 500 (the index is the weighted average price of 500 heavily traded stocks, and is used as an indicator of price trends). The stock-index future is settled in cash, not by delivery of the stocks.

²Futures Industry Association, *Futures Trading Course*, Washington, DC, 1988, p. 1. Historical material in this section was also adapted, in part, from *Futures: The Realistic Hedge for the Reality of Risk*, Chicago Board of Trade, 1988. “To arrive” contracts were used in Liverpool, England, as early as 1780.

³Futures exchanges are authorized to trade futures contracts, options on futures, and options on physical goods.

⁴The 16 exchanges are: the Chicago Board of Trade (CBOT); Chicago Mercantile Exchange (CME); New York Mercantile Exchange (NYMEX); Commodity Exchange, Inc. (COMEX); Coffee, Sugar & Cocoa Exchange (CSCE); New York Cotton Exchange (NYCE); New York Futures Exchange (NYFE); Mid-America Commodity Exchange (MidAm); Kansas City Board of Trade (KCBOT); Minneapolis Grain Exchange (MGE); Chicago Rice & Cotton Exchange (CRCE); AMEX Commodities Exchange (AMEXCC); Philadelphia Board of Trade (PHBOT); Pacific Futures Exchange (PFE); Pacific Commodities Exchange; and American Commodities Exchange.

⁵Commodity Futures Trading Commission, *A Follow-Up Report on Financial Oversight of Stock-Index Futures Markets During October 1987, Jan. 6, 1988*, p. 15.

futures exchange.⁶ For every buyer, there is a seller.⁷ But after the buyer's and seller's understanding of the terms of the trade have been matched, a clearing organization places itself between the buyer and seller; i.e., the clearing organization becomes the seller for every buyer, and the buyer for every seller. It thereby guarantees each transaction. In the example above, if the futures price rises from the September purchase price level, the buyer collects from a futures commission merchant, which collects from the clearinghouse, or pays the futures commission merchant, who pays the clearinghouse, if the price declines.

In 1989, 267.4 million futures contracts were traded, compared to 18.3 million in 1972, when financial futures were introduced.⁸ About 75 percent of this trading occurs on the CBOT and the Chicago Mercantile Exchange (CME), the two largest futures exchanges in the world. Financial futures began in the early 1970s, with contracts on currencies and debt instruments, but as late as 1978 they constituted less than 7 percent of the futures market. This had increased to about 38 percent by 1982, when stock-index futures were introduced; and by 1990, 61 percent of futures contracts traded were financial futures.⁹ Financial futures now account for over three-quarters of the business of the CBOT and the CME.

The CBOT began trading grain contracts in 1848, and now trades futures on metals, oil seed products, and financial instruments. The CME specialized in foodstuffs until 1947; then added livestock and frozen meat futures, which by 1969 accounted for 86 percent of its trading volume; and now mostly trades financial futures. Currently, about 80 futures con-

tracts are traded on commodities ranging from wheat and oil to Treasury bonds.

Almost any commodity might be considered suitable for developing a futures market, if there is considerable variation and hence uncertainty in price.¹⁰ At one time or another, at least 79 products have been covered by futures contracts,¹¹ but by 1967, grains and foodstuffs accounted for more than half of all futures trading. Today, however, futures contracts on agricultural commodities account for only 20 percent of total contract volume. Interest rates accounted for 46 percent in 1989; energy products, 12 percent; foreign currencies and currency indexes, 10 percent; precious metals, 6 percent; stock-price indexes, 5 percent; and nonprecious metals, 0.8 percent.¹² (See figure 4-1.)

U.S. Treasury bond futures are the most heavily traded U.S. futures contract, with a volume of 70.3 million contracts, valued at \$6.3 trillion, each contract based on \$100,000 face value. Eurodollar¹³ futures are even more heavily traded in terms of dollar volume (each contract is for \$1 million), but are second highest in volume of trades.

The main function of futures contracts is still to shift risks from those less willing to bear them to those willing to assume them for a price, or in hope of profit. With the appropriate futures position one can hedge or offset price risk that arises in the 'cash market.' "If the price of grain falls, the value of a short futures contract will rise. (It should be noted that hedging is not cost free; if the market price moves up, having hedged will cut into one's profits.) Futures markets also allow one to speculate on one's expectations about price trends with the possibility of profiting by a successful forecast.

⁶At present, futures contracts are traded only face-to-face on futures exchanges. The CME and the CBOT will soon begin trading futures on GLOBEX, an electronic after-hours trading system (see OTA Background Paper, *Trading Around the Clock: Global Securities Markets and Information Technology*, OTA-BP-CIT-66 (Washington, DC: U.S. Government Printing Office, July 1990). Trades executed on GLOBEX will still be cleared, margined, and guaranteed by futures clearing organizations.

⁷Typically the customer deals with a futures commission merchant (FCM) firm, which in turn deals with a clearing member of the exchange! or, if the FCM is itself a clearing member, then directly with the clearing organization. Details of clearing and settlement are described in the appendix.

⁸FIA Monthly Volume Report, December 1989. Also, 55.4 million options contracts were traded on futures exchanges in 1989, when U.S. futures exchanges traded 322.8 million futures and options contracts.

⁹FIA Summary by Year, December 1989.

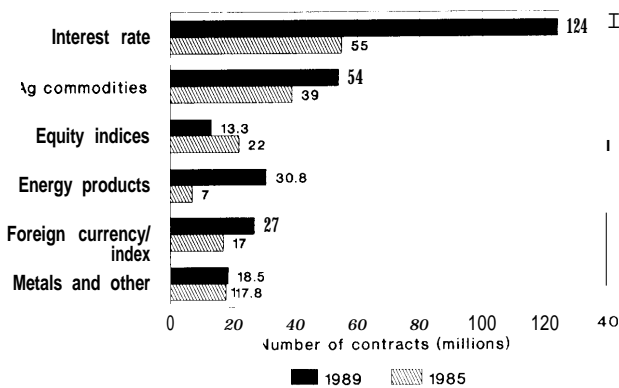
¹⁰Dennis W. Carlton, "Futures Markets: Their Purpose, Their History, Their Growth, Their Successes and Failures," *The Journal of Futures Markets* 4, No. 3, 1984, pp. 237-271. Carlton, pp. 242-244, also discusses other factors: correlations in price with related products such as would allow hedging, many different producers and distributors, industry structure, large value transactions, government regulation influencing price.

¹¹Ibid., p. 242.

¹²Futures Industry Association, FIA Monthly Volume Report, December 1989.

¹³Eurodollars are U.S. currency held in banks outside the United States, and commonly used in settling international transactions.

Figure 4-1—Futures Contracts Trade by Commodity Group



SOURCE: Futures Industry Association, 1990.

From the standpoint of the economy, futures contracts on physical commodities tend to lower prices to the consumer by allowing producers and merchants to plan more effectively, to carry smaller amounts of inventory, and to price their goods more competitively. But financial futures are not well-understood by the general public. Because they are divorced from the underlying commodity or stock,¹⁴ many people view them as only instruments for gambling and as a diversion of resources from more productive uses. This lack of understanding, which the industry has done little to correct, creates problems for the industry. Futures markets, by providing ways to hedge stock investments, may increase the willingness of investors to put their savings into securities rather than other kinds of investments, and most economists say that they do not divert money from capital formation.¹⁶

Another benefit of futures markets is “price discovery.” Prices in futures markets, based on different information and insights acted on by experienced traders risking their own capital, forecast prices in cash markets. This “price discovery” function is valuable in a market-based economy.¹⁷ One expert on futures markets says that in the late 1970s the pivotal development in securities law was the recognition of futures trading as an economic function involving risk transfer and price discovery, and divorced from any specific commodities.¹⁸

REGULATION OF FUTURES MARKETS

Futures trading was regulated for decades by the Department of Agriculture,¹⁹ but as the futures market expanded beyond agricultural commodities into financial instruments, the Department’s role became less appropriate. Recognizing this, Congress in 1974 created the Commodity Futures Trading Commission (CFTC)²⁰ to oversee all trading in futures contracts under the 1936 Commodity Exchange Act. The responsibilities of the CFTC include:

1. direct surveillance of futures markets and market participants,
2. oversight of futures trading Self-Regulatory Organizations (SROs),²¹
3. approval of all new futures contracts and changes in the terms of existing ones, and
4. dealing with investigations and disciplinary and enforcement actions.

¹⁴According to the Internal Revenue Service, futures contracts are not assets, but contractual agreements.

¹⁵For example, a Letter to the Editor of the *New York Times* read: “The millions of futures contract trades executed each year, representing trillions of dollars, are in reality engagements for mutual speculation conducted in an environment of institutionalized chicanery, which except for the employment of several thousand floor brokers in Chicago and New York, serve no useful economic purpose.” (signed A. George Gianis), Dec. 6, 1989, p. A30.

¹⁶A Federal Reserve Board paper, *Financial Futures Adoptions in the U.S. Economy*, December 1986, said: “The conclusion that futures and options markets will not diminish the total supply of funds available for investment seems quite strong and widely accepted.”

¹⁷The Commodity Exchange Act requires that a futures contract market demonstrate to the Commodity Futures Trading Commission [CFTC] that designation of a new futures contract would be in the public interest. Under CFTC practices this means that it would have to be shown that it had a hedging or price discovery function.

¹⁸Charles M. Seeger, *The Development of Congressional Concerns About Financial Futures Markets*, The American Enterprise Institute for Public Policy Research, Project on the Economics and Regulation of Futures Markets, pp. 33.

¹⁹Abuses in grain futures markets led to passage of the Grain Futures Act of 1922. It was administered by the Grain Futures Administration within the Department of Agriculture. In 1936, the Commodity Exchange Act extended this regulation to other agricultural commodities, and this Act was administered by the Commodity Exchange Authority, also in the Department of Agriculture.

²⁰The Commodity Futures Trading Commission Act of 1974.

²¹Self-Regulatory Organizations are the exchanges and the National Futures Association, an industry association to which the CFTC delegates the responsibility for registering and overseeing floor brokers and futures commission merchants. The Commodity Futures Improvements Act, now before Congress, would authorize the CFTC to register floor traders.

Oversight of the CFTC remains with the House and Senate agriculture committees, although agricultural commodities now underlie only a quarter of futures contracts at most.

As the growth of financial futures trading continues, the appropriate locus of regulatory responsibility is again becoming an issue. The "commodities" that underlie the financial futures contracts fall under the regulatory jurisdiction of the Department of Treasury, the Board of Governors of the Federal Reserve System, and the Securities and Exchange Commission (SEC). The invention of stock-index futures has linked futures markets to stock markets in new ways, and raised questions about the effects of those linkages.

THE OPERATION OF FUTURES MARKETS

Futures contracts are traded in auction markets, where prices are determined by "open outcry." In this colorful and noisy form of trading (which has often been described as archaic or anachronistic²²), bidding is conducted in a crowded, tiered floor or "pit." Floor brokers and traders, each wearing identifying badges, trade by shouting their orders and using hand signals. The pit crowd may have more than 400 participants. There are currently no alternative methods of trading futures in the United States; upstairs block trading and over-the-counter trading of futures is forbidden by statute.

Floor traders—also called "locals"—trade exclusively for their own accounts; floor brokers are allowed to do "dual trading," that is, to both transact customers' orders and trade for themselves.²³ When an order to buy or sell financial futures contracts arrives by telephone at the floor booth of an exchange member, the order taker either walks the order to the floor or (for large orders) "flashes" the order by hand signals to a floor trader

in the pit, who makes the trade and flashes back to the booth the price at which it was filled. This information is then repeated to the customer, usually still on the telephone. The entire transaction takes about 3 seconds. Futures brokers insist that this is the speediest way to carry out a transaction, and that nothing slower would be satisfactory to the majority of their customers who are simultaneously trading in cash markets in some form of speculative or arbitrage maneuver. It is not clear however that computerized trading support systems would be slower.

Unlike stock exchange specialists, floor traders have no obligation to stabilize prices. There are other stabilizing mechanisms in futures markets; CFTC analysts stress the importance of price limits and speculative position limits in providing "a similar stabilizing influence."²⁴

In futures markets, each broker and trader can buy at the lowest offered price and sell at the highest bid price²⁵; liquidity is achieved through the participation of many buyers and sellers. Some of these buyers and sellers are hedgers, seeking to protect their investments in securities markets. Some of the buyers and sellers are speculators. Speculators—a term neutral and without opprobrium in futures markets—are professional risk-takers, individuals or firms trading for themselves (or sometimes for institutional funds), who through their willingness to trade in pursuit of profit incidentally keep bid and ask prices close together and facilitate rapid and efficient trade executions by hedgers.²⁶ Ordinarily, hedgers hold about 71 percent of long and 66 percent of short open positions. Speculators are listed as holding about 4 percent of open long positions and 10 percent of open short positions in S&P 500 stock-index futures. The remainder of open positions (about one-quarter) are held by people not

²²As a recent example, Richard A. Miller, editor-in-chief of the *Commodities Law Letter*, wrote: "Dual trading, imprecise audit trails, and club-like self-governance are anachronisms more appropriate to the 19th century than to the 21st." *Commodities Law Letter* ix, No. 9-10, November-December 1989.

²³"Dual trading" occurs when an individual (or representative of a firm) sometimes trades on behalf of customers (i.e., as a broker) and sometimes trades for his own or the firm's proprietary account (i.e., as a dealer).

²⁴OTA correspondent from staff of the CFTC Division of Trading and Markets, Apr. 6, 1990. The CFTC analysts maintain also that the case for the specialist system as a maintainer of stabilized prices in securities markets is not strong.

²⁵The exception is a situation when daily price limits are in effect or when the trade would exceed a speculator's position limits.

²⁶CBOT Futures, *The Realistic Hedge for the Reality of Risk*, 1988, p. 12. The *Dictionary of Finance and Investment Terms* (2nd ed.) says that the term "speculation" implies that a business or investment risk can be analyzed and measured, and it differs from "gambling" which is based on random outcomes.

covered by large-trader reporting requirements. Most of these are also speculators.²⁷

Futures contracts are designed so that their prices should always reflect underlying cash market prices.²⁸ The activities of “spreaders” and arbitrageurs also bring price alignment. In “calendar spreading” traders sell the current delivery-month contract and buy a later delivery-month contract, or vice-versa. This reduces price variance between the contracts. Arbitrage also helps keep the cash and futures prices aligned. If, for example, futures contracts seem overpriced in relation to the underlying commodity, arbitrageurs will sell the futures contract and simultaneously buy the commodity, making a profit on the difference.

ISSUES RELATED TO PIT TRADING

At least three characteristics of open outcry trading may cause problems: crowding in the pits, the lack of an automatically generated audit trail, and dual trading. The presence of as many as several hundred participants, without a central checkpoint (whether computer or designated market-maker), makes it uncertain that a customer will get the best price, or the market price. His floor broker may have a less penetrating voice than others, or be shorter in stature, or unlucky, or unpopular. Pit-based trading is deeply embedded in the history of futures trading, but it has become a problem as the number of participants and the volume of trading greatly increased, and as the speed with which orders can be transmitted also greatly increased (the last being an effect of information technology). It is possible that the pits cannot accommodate additional pressure, as may result from the growth of translational trading. It is also difficult to spot and control collusive and fraudulent trading given the difficulties of visually monitoring the hectic trading.

Audit Trails

The inadequacy of audit trails in futures exchanges is currently a lively issue. Rules require that

the exchange assign a time of execution, within 1 minute, to each trade. The CME reports that it uses the following information to assign times to transactions:

- the time that an order reaches the floor,
- the *Time and Sales Report*, a record of reported sales prices timed to the nearest 10 seconds,
- a 15-minute bracket character recorded by the trader,
- “other trade information,”
- the timing information with respect to the opposite side of the trade,
- the length of time it takes an order to reach the trading pits,
- “unique price information,” and
- “in limited cases, reported execution times.”

Each transaction is run through approximately nine computer processes before a time is assigned at the end.

Using such procedures (which differ somewhat from exchange to exchange), an exchange’s computer is said to be able to “reconstruct” an audit record of the trade that establishes its timing within 1 minute. But at best, these systems still have serious shortcomings that are known both to the CFTC and the exchanges.²⁹ For example, a single minute during active trading may include hundreds of trades, several of which could be made by a single floor participant at different prices.

Moreover, the CFTC says that in some instances, members are not “providing accurate data which will permit an exchange to meet the performance standard,” and that exchanges have “failed to implement adequate measures to address this situation.” The CFTC has just changed the rules to require that trading cards contain preprinted sequencing information; that they identify the user, that they be used in exact numerical and chronological sequence, and that they be promptly time stamped and submitted to a clearing member or to the

²⁷These figures are based on the average of month-end open positions for 23 consecutive months ending November, 1989, as reported in CFTC’s *Commitments of Traders*. (Reported positions are those of the owners of the account, not their brokers or clearing members.)

²⁸CFTC Regulations, Sec. 22247, Appendix A-Guideline No. 1, B(3). CFTC contract approval guidelines require “evidence that the cash settlement of the contract is at a price reflecting the underlying cash market [and] will not be subject to manipulation. . .”

²⁹General Accounting Office, *Chicago Futures Market: Initial Observations on Trading Practice Abuses*, GAO/GGD-89-58, March 1989. This GAO report studied the “level, or intensity, of CFTC [and the CME and CBOT] exchange efforts to detect and penalize trading abuses” between 1984 and early 1989, and made “no recommendations.” Ibid, pp. 13-17.

exchange within 30 minutes of the trade (to be shortened later to within 15 minutes of the trade).³⁰

Even highly automated trading and surveillance systems may not be able to deter certain types of abusive trading practices, especially given the opportunities for collusion among floor brokers and traders in the pits, which are difficult to detect except through undercover investigations.³¹ It may nevertheless be necessary to replace "trade reconstruction" techniques with devices that can establish more precise and verifiable audit trails from the beginning—i.e., at the time of the transaction. Technology is being developed to meet the complex needs and difficult environment of the pits. The CME and CBOT have each appropriated \$2.5 million for design of a hand-held computer for recording trades, and are reviewing vendors proposals. NYNEX has developed a wrist-strap or hand-held computer for floor traders, capable of storing trade data and transferring it to a main computer. These will be tested in 1990 by traders at the Commodity Exchange (COMEX) in New York.³² There is likely to be resistance from some floor professionals who may resent the intrusion on the floor of technology that will erode the value of their unique skills and experience.

Dual Trading

Dual trading, fully legitimate, has become increasingly controversial in the last 2 years. As already noted, floor traders are allowed to trade both for themselves (proprietary trading) and for customers. They charge a fee for executing customer orders

brought to them by futures commission merchants (FCMs), who are analogous to retail stock broker/dealers. From 12 to 25 percent of floor traders' profits come from proprietary trading.³³

Dual trading has been strongly defended as necessary and desirable by the industry, by the CFTC,³⁴ and by academic experts.³⁵ It has, nevertheless, often been criticized because of two potential conflicts of interest. First, dual traders can, when trading for their own accounts, use information communicated by their customers, putting other traders at an information disadvantage. Second, a broker may be tempted to trade on his own behalf before he trades for a customer, if the customer order is likely to move the price. That would constitute "frontrunning," and regulations prohibit brokers from trading for their own accounts before filling customers' orders and from filling customers' orders from the broker's own account, whether or not there is any effect on price.

Futures industry representatives point out that dual trading also occurs in securities markets; for example, 1) an upstairs firm acting as a "block positioner" for a customer (see ch. 3) may buy or sell some of the stock for (from) its own inventory; and 2) specialists trade both for themselves and for other brokers. Securities market practitioners say in rebuttal that this form of dual trading is different in kind from dual trading in the pit; for example, specialists have a "negative obligation" to trade for themselves only when no other customer is willing to trade at or near the last-sale price).

³⁰The CBOT has, since Sept. 1, 1989, "made members accountable" for keeping trading cards in numerical order and timestamped by the clearing member when they are collected for clearing and settlement.

³¹According to U.S. attorney Anton Valukas, who headed the Justice Department probe into trading abuses in the Chicago exchanges, "... experience suggests that some of the things we found could only have been discovered by having people actually in the pits. ... The whole aspect of how audits are conducted and what type of audit trails are kept is something that should be reviewed." As quoted in "Paladin in the Pits," *Barren's*, Aug. 21, 1989, p. 6.

³²Demonstrations and conversations with NYNEX scientists in White Plains, New York; see also "Will Paperless Trading Clean Up the Pits," news item in *Business Week*, Oct. 16, 1989, p. 90A.

³³The CFTC estimates 12 percent (in written comments to OTA); several knowledgeable futures markets participants told OTA it was probably 20 to 25 percent in financial futures pits, and the Chicago Mercantile Exchange declined to provide information on the grounds that it is confidential. The CFTC estimate does not distinguish between commodity futures pits and financial futures pits. They may or may not be different in this regard, but dual trading is more common in highly active markets, according to CFTC studies.

³⁴In background discussion published in the *Federal Register*, vol. 55, No. 8, Jan. 11, 1990, p. 1048, in connection with a proposed rule to restrict dual trading in some circumstances, the commission stated that its traditional position had been that notwithstanding concern over possible abuses, "(1) dual trading was necessary to achieve adequate market liquidity and accompanying market efficiencies, and (2) the potential for abuse could be addressed adequately. ... CFTC Division of Trading and Markets analysts in discussions with OTA also emphasized that dual trading increases liquidity and that abuses can be adequately controlled by regulation and surveillance.

³⁵For example, Professor Sanford Grossman says: "Dual trading increases the supply of both brokers and floor traders because a dual trader can earn income from two activities to cover the costs of training, an exchange seat, and time spent on the floor. ... The direct effect is an increase in the quality and quantity of brokers. ... The indirect effect derives from an increase in the liquidity of the market caused by an increase in the numbers of market makers." Prof. Sanford Grossman, *Economic Analysis of Dual Trading*, Research Paper, Rodney L. White Center for Financial Research 4 1989.

Both critics and defenders of dual trading may have exaggerated its frequency. A recent study by the CFTC found that most floor traders do in fact usually limit themselves to one kind of activity. About 90 percent of them either do at least 90 percent of their trades for themselves or else do 90 percent of their trades for customers. The other 10 percent—frequent dual traders—account for only 7.4 percent of total market volume. The incidence of dual trading may however be higher in financial futures pits.³⁶ The issue is important because dual traders were heavily implicated in recent FBI charges of abuses in futures trading.

Section 4 of the Commodity Exchange Act required the CFTC to reassess the effects of dual trading and its continued permissibility from time to time. In 1976, an extensive study by a CFTC Advisory Committee found that the record systems then used by exchanges were inadequate to permit verification that dual trading was important in maintaining liquidity, yet recommended that the Commission continue to permit it, which it did. In 1984 another CFTC report³⁷ said that if dual trading were to continue an improved audit trail was needed for more effective surveillance.

The CME, in May 1987, began experimentally to disallow dual trading on the top step of the stock-index futures trading pit. The exchange says that this was done because the top step, where most of those trading for customers stand, had become overcrowded. Also, locals (trading for themselves) complained that those on the top step (some of whom were dual trading) had an advantage over them in visibility. The CME concluded after the first 2 years that there was little effect on liquidity; but decided that this might not be the case with less actively traded contracts, and that for them “dual trading is a necessary practice to maintain adequate liquidity. . . .”³⁸

In 1989 the CFTC Economic Analysis Division conducted yet another study on the effects of dual trading.³⁹ It concluded that dual traders generally specialize in one or the other form of trading, as noted above; that the incidence of dual trading tends to be higher in high-volume markets than in low-volume markets (which challenges the assumption that it is useful because it assures liquidity); and that dual traders do not, as often asserted, secure better trades for their customers than do non-dual traders. The agency therefore issued a proposed rule in January, 1990, concerning Restrictions on Dual Trading by Floor Brokers. Regulation 155.5 would prohibit a floor broker from trading for himself and for customers during the same trading session, “except to the extent permitted by contract market rules.” The notice of proposed rulemaking cited the economic analyses in its November report, and also emphasized that the enforcement actions, indictments, and plea agreements from the Chicago undercover investigation of floor trading practices “indicate that some brokers have used their dual status to facilitate abuses of customer orders.”

This rule change will not end all dual trading. It is intended “to curb dual trading-related abuses,” while permitting the practical results to be tested “on a limited basis before the restriction is extended to all markets.” It would apply at first to only one or two commodities futures contracts and one financial futures contract at each exchange, and would allow exceptions, for example, a “customer opt-out.”

INNOVATIONS IN FUTURES CONTRACTS

The CFTC must approve a new futures contract before it is traded. It must be satisfied that the contract has an economic purpose and is not contrary to the public interest.⁴¹ Innovations in futures instruments have been frequent during the past 15

³⁶CFTC Division of Economic Analysis, *Dual Trading Study*, Nov. 17, 1989. Neither this report, or the CFTC staff responsible for the study, distinguished between commodity futures trading and financial futures trading; these statistics were broken down only by exchanges. The study concluded, however, that dual trading tended to be higher in the most active markets. This would include financial futures markets, although CFTC does not draw this conclusion.

³⁷U.S. Commodity Futures Trading Commission, *A Study of the Nature, Extent, and Effects of Futures Trading by Persons possessing Material Nonpublic Information*, Washington, DC., September 1984.

³⁸Report of the Chicago Mercantile Exchange: Special Committee to Review Trading Practices, to the Board of Governors, Apr. 19, 1989, pp. 7-8.

³⁹Economic Analysis of Dual Trading in Commodity Exchanges, Nov. 17, 1989.

⁴⁰Federal Register, vol. 55, No. 8, Jan. 11, 1990, p. 1050. The proposal of the new rule stressed that “the current systems are not capable of detecting all abuses related to dual trading.”

⁴¹Until 1974, futures contracts could be issued and traded unless disapproved by the Department of Agriculture. The SEC is not required to assess the economic value of new securities, but has evaluated the economic purpose of proposed options, such as those on stock indexes and Treasury securities.

years, and are likely to continue.⁴² For example, two exchanges announced plans last year to introduce trading in futures contracts on computer memory chips⁴³—commodities whose prices tend to be volatile.

Exchanges introduce new products if they may make money. But it is really the profit or cost-saving for a particular group of market participants (e.g., floor traders, or speculators, or hedgers) rather than profit for the exchange that drives the process, because U.S. exchanges are not-for-profit organizations. According to the CFTC, exchanges sometimes may introduce anew product if there is demand for it by one of these member groups even if it is marginally nonviable, because there can be cross-subsidization from more viable contracts.

Not all new products are approved by the regulators, and those that are approved are not always successful. *Success* depends in large part on the needs of investors. For example, the rapid success of interest rate futures reflected a widespread investor demand to reduce risk from adverse movements in this market.⁴⁴

Futures contracts tend to be traded on only one exchange; that is, even if the product was introduced almost simultaneously on several exchanges, the trading quickly concentrates. There is intense competition among exchanges to be the first to introduce new products, and they sometimes submit copy-cat products for regulatory approval. Significant costs are associated with developing and introducing new products, and they have a high risk of failure—according to the CFTC, from 20 to 30 percent of new contracts fail within 2 years, and 50 to 55 percent endure less than 9 years. This has led some exchange officials to suggest an exclusive right to a new product⁴⁵ for a specified length of time, similar to a patent. However, this right would have to be

recognized by all of the world's major exchanges in order to protect fully the original innovating exchange. This is unlikely, given the present state of international law on protection of intellectual property.

Some innovations do not fall neatly within the jurisdictional boundaries assumed when the Securities Exchange Act and the Commodity Futures Exchange Act were written. This has been the cause of heated disputes between the two regulators, as discussed later in chapter 6.

STOCK-INDEX FUTURES

The most important innovative product in this decade is stock-index futures, introduced in 1982. This product and the various trading strategies that rely on it are the critical link between stock and futures markets. Since they were first introduced in 1982, stock-index futures trade volume has grown faster than volume of stock transactions, exceeding the daily volume of New York Stock Exchange (NYSE) trades in the first 2 years. However stock-index futures still constitute only about 5 percent of all futures trades.

The volume of stock-index futures trading has increased primarily because the number and size of institutional investors have grown. Futures markets have always been used heavily by institutions.⁴⁶ Some individual traders participate, both as speculators and as hedgers, but many retail clients cannot meet brokerage house annual income and net worth requirements for margin accounts.

Institutional investors are hedgers, using futures contracts as a means of reducing market risks and lowering transaction costs. To hedge investments in any cash market they may take an equal but opposite

⁴²For a discussion of competition between futures exchanges as a source of innovative products, see William L. Silber, "Innovation, Competition, and New Contract Design in Futures Markets," *The Journal of Futures Markets*, vol. 1, No. 2, 1981, pp. 123-156.

⁴³These are dynamic random access memory chips or DRAMs. The Pacific Stock Exchange and the Twin Cities Board of Trade (Minneapolis) hope to start trading a futures contract on computer memory chips in 1990 or early 1991. Approval of applications to trade new contracts generally take 3 to 6 months; innovations that present complex issues or require new exchanges may take much longer.

⁴⁴For a discussion of various types of risks, particularly from foreign currency movements, and a process toward managing such exposures, see: Jeffrey Barr, "Coping With Financial Risk," *Institutional Investor*, vol. 3, April 1989, pp. 112-113.

⁴⁵This was advocated, for example, by Richard Chase, Executive Vice president of the Philadelphia Stock Exchange, at an OTA workshop, June 30, 1989.

⁴⁶Carlton, *op. cit.*, footnote 10. Before the development of financial futures, many of those using the commodities futures market were "commercials," such as large cereal companies or meat packing companies.

position in the futures market.⁴⁷ They can switch back and forth rapidly and cheaply, since transaction costs are low, and small or medium-sized futures trades tend not to move market prices because of the liquidity in these markets.

Institutional investors often choose to allocate the assets they manage in specific ways, e.g., by keeping 60 percent in bonds, 25 percent in equities, and 15 percent in cash, depending on factors such as the outlook for interest rates or equities prices. Asset allocation strategies are not new, but until recently, allocation readjustments could not be made rapidly or efficiently because transaction costs were high. Today's futures contracts let asset managers reallocate assets rapidly because of their low costs and narrow bid-ask spreads. This links the equity, options, futures, and government/corporate bonds markets in the United States and, increasingly, the major world markets.

Stock-index futures are used for speculation, hedging stock market investments, and index arbitrage. The most popular stock-index futures contract is the CME S&P 500 Stock Price Index Future (it accounts for 79 percent of total volume). There are also options on stock indexes, traded on securities exchanges, and options on stock-index futures traded on futures exchanges.

Parties to a stock-index futures contract agree to settle by receiving or delivering a cash sum equal to the difference between an amount stipulated in the contract and the weighted prices of the stocks in a stock index (usually the S&P 500)⁴⁸ at a stipulated later time. The contract obligations can only be settled by cash payment, not by actual delivery of stocks. One trading in stock-index futures is, in

effect betting on the movement of the stock market as a whole—whether the average stock price will move up or down. A more academic way of saying this is that the trading is based on an analysis of the return to be derived from a projected movement of the stock market as a whole.

Both stock-index futures and stock-index options are based on (or derivative of) the stock market. Their nominal value is derived from the weighted average of values of the stocks represented in one index.⁴⁹ But stock-index futures (and options on stock-index futures) are traded on futures exchanges and regulated by the CFTC, while the SEC regulates stock-index options as well as stock.

While stock-index futures and stock-index options serve some of the same purposes, they are different in effect and in risk-return characteristics. Stock-index futures create the *obligation* to deliver or receive the cash equivalent of a portfolio of stocks. Stock-index options gives the holder the *right* but not the obligation to receive or deliver the cash equivalent. For the holder of either a long or short stock-index futures position, the risk is limited only by how much stock prices can move in a given time—it can be a ruinous amount. With the option contract, the purchaser can lose only what he paid for it (the premium), since the option need not be exercised; and he has unlimited potential for gain if stocks appreciate so as to increase the value of the options contract. The *writer* (seller) of an uncovered or “naked” option contract (as opposed to the holder of the contract) unless he is fully hedged, has unlimited risk like that of the unhedged futures contract holder, cushioned only by the premium the writer received for writing the option.

⁴⁷For example, a financial institution may be concerned that interest rates will rise, causing a drop in the value of the firm's long-term U.S. Treasury bonds. The firm may hedge that risk by selling interest rate futures contracts. If interest rates rise, the futures contracts can be closed out for a profit, which would compensate for the loss of value in the bonds. An investor having on-U.S. funds invested in a foreign country may wish to reduce the risk of a fall in the value of that country's currency against the U.S. dollar or other countries' currencies. The investor might sell the appropriate foreign currency futures contracts to hedge the risk of the currency's fall relative to the U.S. dollar, or, as do many U.S.-based international mutual funds, might shift to futures contracts based on the currency of another country whose currency movements are highly correlated with that of the United States (cross-hedging).

⁴⁸The contract is based on the value of the S&P 500 index multiplied by \$500. If the weighted average of the value of the 500 stocks represented in the index is 245, one futures contract would be worth 245X \$500 or \$122,500. The contract would call for the buyer to buy or “go long in” the S&P 500 at 245 on the expiration date. If on some earlier date the S&P 500 stood at 247 the holder might choose to sell or offset the futures contract. He or she would make a profit equal to the current market price minus 245 multiplied by \$500, or a profit of \$1,000. If instead, he or she holds the contract until the expiration date and the S&P 500 has risen to 248, the buyer's profit would be \$1,500. If at expiration the index stood at 242, the buyer would have lost \$1,500.

⁴⁹There are no futures contracts on a specific stock. The SEC has opposed such contracts on the grounds that the futures contract could be used to manipulate the price of the stock to the detriment of the corporation and its shareholders. At the insistence of the CFTC, the Shad-Johnson Accord, an agreement between the CFTC and the SEC (discussed in ch. 6), left open the door by saying that there should be further study of the practicality and safety of allowing futures on individual stocks. Subsequent legislation prohibited such contracts. [Information based on oral and written discussion with staff of the CFTC and SEC.]

From 1982 through September 30, 1989, the CFTC approved and exchanges began trading 33 index futures contracts, of which 6 are now trading. The others are dormant or have been withdrawn. In 1989, the CME'S S&P 500 Stock Price Index Futures Contract accounted for over 79 percent. The New York Futures Exchange Composite Index accounts for 12 percent, and the Chicago Board of Trade's Major Market Index (MMI), 8 percent.⁵⁰

THE USES OF STOCK-INDEX FUTURES

The trading of stock and stock-index futures is dominated by institutions and brokerage proprietary accounts, while that of stock-index options has until recently been dominated by individual investors and retail brokers. (Stock-index options are now being increasingly used by institutional investors in hedging.) The reason they were preferred by individuals is in part the size of the contracts. The S&P 500 futures might, for example, have a nominal value of \$142,500 (the value of the index times the multiplier of \$500); and at the same time the S&P 100 options contract might have a nominal value of \$28,000. For institutions, the futures contract is more attractive because there is greater liquidity in its trading, and there are also cost incentives (see table 4-1).

In the S&P 500 futures trading pit at the CME there are usually several hundred brokers and floor traders or locals. With so much competition, spreads under normal circumstances are much tighter than price spreads in the underlying stock.⁵¹ On a typical day, floor traders may be responsible for over 50 percent of the trades, and customers (both institutional and individual) for less than 30 percent.⁵² Floor traders may buy and then sell the same contracts in as little as 1 or 2 minutes, perhaps buying or selling 100 or more contracts at a time,

Table 4-1-incentives for Using Stock-Index Futures

	S&P 500 Portfolio of Stock	S&P 500 Futures
Cost Incentives:		
Volume	2.3 million shares	800 contracts
Transaction cost per unit	\$.07 cents per share	\$12.50 per contract
Total transaction costs	\$318,000	\$20,000
Market Impact Incentives:		
Market	Bid: 292.35 Ask: 293.65	Bid: 294.85 Ask: 294.90
Bid/ask spread1 .30 index points	0.05 index points
Dollar value	\$520,000	\$20,000

SOURCE: R. Sheldon Johnson, Morgan Stanley

hoping to make a profit of \$2,000 to \$5,000.⁵³ Because of the great liquidity of the stock-index futures market, large incoming orders can usually be executed rapidly, often with two or more locals (floor traders) sharing the other side of an order.

Changes in stock-index futures prices usually precede changes in stock prices. An investor can buy or sell the S&P 500 Futures Index with one trade, while to assemble a comparable portfolio of stocks might take 500 separate transactions. Thus investor opinions about the stock market are registered more quickly in the futures market than in the stock market.⁵⁴

Stock-index futures are used in inter-market arbitrage and in inter-market hedging. These maneuvers are implemented, on the stock market side, through program trading-i. e., the use of computers to send sell (or buy) orders simultaneously for a large basket of stock.⁵⁵ About half of program trading is in the form of index arbitrage.⁵⁶

Index arbitrage exploits the fleeting price differences that occur between a stock-index future and

⁵⁰Monthly Volume Report December 1989.

In August 1988 one study found the S&P 500 average spread to be 0.0185 in contrast to 0.55 in the underlying stock Salomon Brothers, *Stocks Versus Futures for the International Investor: Trading Costs and Withholding Taxes*, Aug. 31, 1988, p. 3.

⁵²For example, on Feb. 8, 1989, CBOT data showed that 52.9 percent of that day's trades were floor traders trading for their own account; 20.9 percent were trades for a clearing member's house account; and 26.2 percent were trades for another exchange member or for any other type customer.

⁵³Brady Commission Report, W-20.

⁵⁴Hans Stoll and Robert Whaley, "Futures and Options On Stock Indexes: Economic Purposes, Arbitrage, and Market Structure," *Review of Futures Markets*, vol. 7, No. 2, 1980.

⁵⁵NYSE defines "program trading" as the purchase or sale of 15 or more stocks with a value of over \$1 million. The volume of program trades per month varies typically between 7 and 14 percent of total trades. No all program trading, however, involves both stock and futures markets.

⁵⁶NYSE monthly program trading press releases.

the underlying basket of stock.⁵⁷ For example, on January 27, 1989 (to take a day chosen at random), the S&P 500 closed at 293.82 and the S&P 500 March futures closed at 296.30. In index arbitrage one might sell the futures contract at 296.30 and buy the underlying stocks at 293.82.⁵⁸ If the final index average were at 300 on March 17 (the third Friday of the quarter, when contracts expire) the institutional investor could let the futures contract expire with a loss of 3.70 (300-296.30) and sell the underlying stocks for a gain of 6.18 (or 300-293.82), preserving the spread that existed on the day of the original transactions. The actual profit on this transaction would be the price difference of 2.48 minus the cost of the transactions (and the foregone interest not recouped as dividends).

Locking in the spread between stocks and stock-index futures is not automatic; an apparent opportunity to do profitable index arbitrage may be lost in the time it takes to execute the orders in the two markets. This risk from the time gap is especially significant when the arbitrageurs buy the futures and sell index stocks short (i.e., sell stocks they do not yet own, expecting to buy them subsequently at a lower price), because under SEC Rule 10a-1, short sales of stock must be executed at a price the same as, or higher than, the last price (the uptick rule). If the market is declining, arbitrageurs may not be able to sell stocks when they need to.⁵⁹

If the arbitrageur already owns the underlying stocks, he or she could buy the futures, sell the stock, and invest the proceeds in a risk-free debt instrument, such as a Treasury bill. At expiration, when the differential between stock and future disappears, the stocks could be repurchased with the proceeds of the Treasury bill, and the futures contract be allowed to expire.

Opportunities for index arbitrage should disappear rapidly as arbitrage brings the stock and futures prices into convergence. In fact, the opportunities sometimes persist, both because of the difficulties posed by the uptick rule and because there are not many firms with the capital necessary to do index arbitrage.⁶⁰

Index arbitrage should also act to stabilize the markets by continually bringing stock prices and futures prices closer together. But four times a year, the expiration of stock-index futures and options contracts places a great strain on equity markets. As futures and options traders 'unwind their positions' by selling the stock that has been hedged by index options or futures, specialists on stock exchanges are called on to match those orders by finding buyers or buying for their own account. (Alternately, "unwinding" could involve arbitrageurs buying stock and specialists or customers selling them stock.) At the last trading hour of the quarter, called the "triple witching hour,"⁶¹ large imbalances of orders can develop and price volatility increase accordingly.

This problem was helped some by moving the expiration of the S&P 500 futures and options to the opening, rather than the closing, of the third Friday of the quarter. In this way, orders can be matched and executed on that day's opening price, and other efforts can be made to restore balance before the market opens. The CBOE'S S&P 100 option and AMEX'S Major Market Index option still expire at the close, with resulting stress. The SEC is encouraging them to change also.

Hedgers use stock-index futures in reducing the risk associated with a broad portfolio of stocks. Institutional fund money managers often develop and hold an "index" of stocks (i.e., a portfolio that

⁵⁷Such price differences reflect several factors: 1) transaction costs for stocks and for stock-index futures; 2) the time remaining to expiration of the index and the volatility of the index; 3) the institution's cost-of-carry, and 4) the dividends to be paid on the stocks in the index, through expiration of the futures' contract.

⁵⁸In theory, one would sell the future and buy the stock if the differential in their price exceeded the (risk-free) interest rate to expiration of the futures plus the transaction costs in the futures and stock markets, minus the dividend yield on the index, to expiration. When the index futures contract expires, its terms require that its value will be determined by the underlying stocks; that is, the differential or spread disappears.

⁵⁹The SEC warned on Apr. 25, 1990, that it would act to discourage brokers from "misinterpreting" a 1986 exemption to the rule that applies to transitional index arbitrage [e.g., buying a basket of stock in London, selling the S&P 500 in Chicago, and then selling the stock portfolio in New York if the prices are falling]. Firms unwinding a stock position acquired overseas, according to SEC, will be more strictly monitored in the future to prevent them from using translational trading to avoid the uptick rule that would apply to trading in New York.

⁶⁰Estimated in 1987 to be at least \$25 million; see N. Katzenbach, *An Overview of Program Trading and Its Impact on Current Market Practices*, 1987, p. 13.

⁶¹Options and futures on stock-indexes expire concurrently, causing large-scale trading of the options, futures, and stocks.

mimics the basket of stocks represented in a standard index such as the S&P 500). They do this to be sure that their investment does at least as well as the market (even though this also means they will usually do no better). Replicating an index has other advantages over assembling a portfolio from scratch: it is less expensive to manage, since it does not require comparable investment advisory fees, and transaction costs are less. About 20 percent of all stock owned by pension funds is estimated to be indexed.⁶²

Most institutional funds also hedge their indexed funds to further reduce their market risk. This could be done with index options, or with stocks and riskless assets such as Treasury bills, but typically it is done with stock-index futures. Some institutional investors do “dynamic” hedging, a continuous effort to lock in gains or minimize losses by buying and selling baskets of stocks and/or the stock-index future, depending on which is momentarily most attractive. Some index funds may turn over every share in the portfolio a half-dozen or more times a year.

One means of hedging that became popular during the 1980s was portfolio insurance, a mechanical hedging strategy that involves ‘the sale of securities into a declining market in order to protect a portfolio against large losses.’⁶³ The concept may predate stock-index futures and options but now regularly uses them, and is also now generally exercised through a series of computer algorithms or models. When some marker such as the S&P 500 declines to a trigger level, the investor’s computer might generate an order to sell S&P 500 stock-index futures or alternatively to sell the stock portfolio, to ensure against further declines. A typical goal in portfolio insurance is to make sure that at least 95 percent of the value of a current portfolio is safe from loss.

THE DEBATE ABOUT STOCK-INDEX FUTURES

After the 1987 crash, there was widespread concern that program trading—especially portfolio insurance and index arbitrage—may have contributed strongly to the debacle. Immediately after the crash, several reports said that inter-market programs (using stock-index futures) were a major factor. The Brady Report said that “By reasonable estimates, the formulas used by portfolio insurers dictated the sale of \$20 billion to \$30 billion of equities over this short time span [Oct. 19-23],’ and thus “played a dominant role” in the crash.⁶⁴ The SEC reported that at least 39 million shares were sold by institutions on October 19 alone because of portfolio insurance strategies that called for stock sales either in lieu of futures transactions or as a supplement to them.⁶⁵ That report said that “the various strategies involving program trading were a significant factor in accelerating and exacerbating the declines.’

This was not universally accepted, and especially not within the futures industry and the CFTC. The Chicago Mercantile Exchange concluded that “index arbitrage does not appear to have played a major role in the crash,” and program trading “does not by itself explain the magnitude of the crash.’ The CFTC report said that the trading data “does not provide empirical support for the theory that hedging in the futures market and index arbitrage activities interacted to cause a technical downward price spiral of stock prices.”⁶⁶ Both have continued to maintain that position.

The suspicion voiced by critics of futures markets was that when stock prices began to decline, program trading *using* stock-index futures accelerated and magnified price movements. The problem, according to these critics, is twofold: 1) the program trading may cause traders to dump stock in a declining market, and more importantly, 2) many

⁶²The largest index investors are New York State Common Fund, and the pension funds of New York State Teachers, the Exxon Corp., California State Teachers, and Central State Teamsters. From 74 to 100 percent of each of their portfolios is indexed. In 1988, this was a total of about \$38 billion for these five investors. (Reported by *Wall Street Journal*, Oct. 20, 1989, using figures provided by *Pensions & Investment Age Magazine*.)

⁶³William S. Haraf, “Lessons of the Stock Market Crash: What We Have Learned About Securities Markets and Their Regulation,” *The AEI Economist*, May 1988.

⁶⁴Report of the presidential Task Force on Market Mechanisms, Washington DC, 1988, p. 41.

⁶⁵The Securities and Exchange Commission, Division of Market Regulation, *The October 1987 Market Break*, 1985, pp. xiii and 1-5.

⁶⁶Commodity Futures Trading Commission, *Final Report on Stock Index Futures and Cash Market Activity During October 1987*, Washington, DC, 1988, p. 137.

institutional investors, with very large portfolios, may **act in concert, using the same or very similar** formulae and the same market signals, rather than disparate bits of information that might add up to a balanced assessment.

The Brady Commission said, however, that the real problem was the failure of index arbitrageurs to hold the stock and futures markets' prices together once prices began to slide: ". . . the problems of mid-October can be traced to the failure of [stock markets, options markets, and futures markets] to act as one. A third view was that, at worst, stock-index arbitrage had increased volatility slightly by increasing the speed with which new information is reflected in market prices."⁶⁷

The particular form of inter-market program trading described above as portfolio insurance was most vulnerable to criticism because in 1987, many large institutional investors were using the same or very similar formulae. A sudden sharp fall in stock prices would call for an increase in the portfolio share allocated to lower risk debt securities and hence a corresponding decrease in the equity proportion; stocks sales would surge. Portfolio insurance programs would trigger buying and selling that reinforced the direction of the initiating stock market move.

Some defenders of portfolio insurance and stock-index futures point out that "traders have always dumped stock in a declining market and bought in a rising market." But the classical theory of market equilibrium holds that a declining market will attract buyers who follow the rule of 'buy low, sell high.' In portfolio insurance, situations occur where either all participants are using similar algorithms to make decisions, or so many sellers attempt to sell so many shares so quickly, there is no time for buyers to be recruited.

One problem with this kind of portfolio insurance became clear to users after the 1987 crash. The typical formula directed that stocks be sold when their price dropped to a certain level or "stop-loss price," but prices were falling so rapidly that they often skipped over the trigger price, with **no** transaction occurring close to that price on the slide downward. 'Stop loss' orders did not get fired and it may have been some time before the would-be seller could establish that fact. This is the problem of the "gapping market." It clearly contributed to the panic that set in on October 19.

Until the 1987 crash, the use of portfolio insurance was growing rapidly, increasing fourfold in the first 9 months of that year, and covering an estimated \$60 billion to \$90 billion of equity assets.⁶⁸ Some large securities firms publicly renounced both index arbitrage and portfolio insurance strategies after the market crash in 1987. Program trading fell to about 6 percent of NYSE average daily volume. Most of those firms subsequently resumed their use at least for customers.⁶⁹ But after a severe one-day market decline on October 13, 1989, there was renewed agitation against "program trading." Several firms again publicly renounced the practice. The NYSE called for voluntary restraints and announced that it was initiating controls and establishing a blue ribbon panel to study the whole question of volatility.⁷⁰ The CME announced that it would "tighten its rules on trading halts in falling markets." These measures were to some extent attempts to disarm public hostility and head off more drastic congressional actions. They were criticized both by those who saw the limits as too weak, and by many institutional investors who saw any limits on computer-based inter-market trading strategies as harmful to risk management. Some institutional investors threat-

⁶⁷William S. Haraf, then of the American Enterprise Institute, pointed out: "Because trading index futures is the best way to quickly adjust the proportions of debt and equity in a portfolio, trades based on news about the near-term macroeconomics outlook . . . are often directed first toward the index futures markets. . . . Arbitrage ensures that stock prices adjust quickly to the new information initially transmitted to the index futures markets. To those on the floor of the stock exchanges, it may look as though futures trading *caused the* market to move, but that is only because it is the preferred market for trading on macroeconomic information, op. cit., footnote 63, p. 3.

⁶⁸Brady Task Force Report, 1988, P. 29.

⁶⁹For example, Dean Witter says that it ceased using program trading for its own account in 1987 but continued to do it for customers until July 18, 1989. Merrill Lynch, Salomon Brothers, Paine Webber, and Shearson also program-traded for customers but not for their proprietary accounts for some period after October 1987.

⁷⁰The panel, chaired by Roger B. Smith, chairman of General Motors Corp., reported in June 1990. It did not recommend restrictions on program trading, but did recommend stronger circuit breakers to control volatility.

ened to continue program trading manually or move their equities transactions to off-exchange markets.⁷¹

The debate continues as to whether the use of stock-index futures in some or all kinds of inter-market trading strategies: 1) caused or contributed to the crash of 1987, or 2) in general, leads to or contributes to excess volatility in securities markets. The empirical studies that deal directly with this issue do not, in the aggregate, provide conclusive, answers:

- G.J. Santoni (whose research was concluded and reported prior to the 1987 crash) concluded that daily cash market volatility was slightly lower after 1982 (when stock-index futures were introduced) and weekly volatility was slightly higher, but neither difference was statistically significant.⁷²
- Professors Stoll and Whaley, a year before the 1987 crash, found that stock price volatility increased around the triple-witching hours, but this volatility did not last long.⁷³
- Professor Frank Edwards found, in June 1987 that stock return volatility was not higher on average since the beginning of trading of futures and options, but was higher on futures expiration days, especially in the last hour.⁷⁴
- Lawrence Harris, using data covering 1982-86, reported that before 1985, the volatility of stocks represented in the S&P 500 index was not significantly greater than the volatility of non-index stocks when allowance was made for relative risk, price, firm size, and trading frequency. He concluded that the stock-index

futures did not affect stock volatility in the first 3 years. In 1985 and 1986 index stock did show more volatility.⁷⁵ Harris nevertheless said that rather than destabilizing the cash markets, trade in futures and options may serve to make the cash markets more efficient, causing them to adjust more quickly to new information.

- In another study of the week of the crash, Harris concluded that “the crash might not have been as large’ had it not been that exchange regulation, congestion in the order and confirmation systems, and other difficulties in executing sale orders in the stock market “removed a significant flow of buy orders in the futures market” and increased the number of sell orders coming into the futures market.⁷⁶ This, Harris says, accelerated drops in futures prices, and they were transmitted to the stock markets since “the evidence strongly suggests that the cash follows the futures market.”
- Professor G. William Schwert concluded that over the long run, stock market volatility of rates of return “have not been unusually high in the 1980s, except for very brief periods such as October 1987.” Therefore “there is little evidence that the level . . . has increased *since* the beginning of trading [of stock-index futures] . . . in the early 1980s.’ Schwert *also* says that there is evidence that large levels of trading occur when volatility is high, but he cannot tell “whether the large volume causes high volatility, or whether large volatility and trading volume are caused by the arrival of important information.”⁷⁷

⁷¹About 6 million shares a day are exchanged by several hundred large institutions in the third market, through two off-exchange electronic systems: Crossing Network (Reuters/Instinct) and Posit, a system run by a Los Angeles securities company. Most of these program trades do not involve stock-index futures (for which there is no legal off-exchange trading), and are done to liquidate or rebalance portfolios built during the trading day. But it is possible that if program trading is forbidden on the exchanges, much of it could move to these off-exchange systems.

⁷²G.J. Santoni, “Has Programmed Trading Made Stock Prices More Volatile,” *Economic Review*, Federal Reserve Bank of St. Louis, May 1987, pp. 18-29.

⁷³Hans Stoll and R. Whaley, “Expiration Day Effects of Index Options and Futures,” Monograph Series in Finance and Economics, No. 1, Salomon Brothers Center for the Study of Financial Institutions, New York University, 1986.

⁷⁴Frank Edwards, “Financial Futures and Cash Market Volatility,” CSFM Working Paper 159, Columbia University, June 1987. In subsequent papers, Edwards concluded on the basis of review of major agency and academic studies of the crash that higher margins and price limits cause price inefficiency. “Does Futures Trading Increase Stock Volatility,” *Financial Analysis Journal*, January-February 1988, pp. 63-69.

⁷⁵Lawrence Harris, “S&P 500 Futures and Cash Stock Price Volatility,” Working Paper, University of Southern California, Los Angeles, CA, May 1988.

⁷⁶Lawrence Harris, “The October 1987 S&P 500 Stock-Futures Basis,” *Journal of Finance*, vol. 44, No. 1, March 1989, pp. 77-79. Nonsynchronous trading refers to the fact that the S&P 500 index lags behind the real value of the underlying basket of stock when some of the constituent stocks have not recently traded (since the “true” value of the stock may change between trades). If the price of the futures contract is efficiently mirroring the “true” value, Harris says, spurious conclusions about volatility, market efficiency, and the relation between the futures and cash markets can be obtained.

⁷⁷G. William Schwert, “Stock Market Volatility,” NYSE working paper No. 89-02, December 1989.

- Al McGartland and George Wang, in a study for the CFTC,⁷⁸ developed a model that compared exchange-traded stock volatility with volatility in the over-the-counter (OTC) market (which has no derivative futures contracts). They concluded that in 1984 and 1985 stock-index futures decreased cash market volatility somewhat and in 1986 and 1987 [data after Oct. 1, 1987 were not included] “cash market volatility increased somewhat as a result of stock-index futures.” McGartland and Wang said: “However, even if daily volatility is increased slightly by stock index futures, like Harris (1988) we do not know if this is good or bad. It maybe that stock index futures allow the S&P 500 cash market to reflect market fundamentals more rapidly than the cash OTC market. In this case, the increased volatility is beneficial since prices more accurately reflect market fundamentals. The increase in volatility may be due to temporary shortages of liquidity.”
- Dean Furbush, in a study for the SEC, analyzed data over 5-minute intervals for October 14 to 20, 1987, and concluded that: 1) index arbitrage was insufficient to keep futures prices from falling to unprecedented discounts relative to their fair value; 2) the size and persistence of the futures price discount induced much of the heavy portfolio insurance selling to spill from the futures market into the stock market; 3) despite the increased volume of program trading on October 19, “this study does not find that greater price declines systematically occurred at times of more intensive selling by portfolio insurance or any other program trading strategies.”⁷⁹
- Lawrence Harris, George Sofianos, and James E. Shapiro, in a 1990 paper for the New York Stock Exchange, examined data on the relation-

ship of volatility to program trading and concluded that futures price changes instigated program trading which led to stock price movement.⁸⁰

- Chen-Chin Chu and Edward L. Bubnys found that volatility in S&P 500 futures is higher than volatility in the cash market.⁸¹

There is no clear consensus on the effects of stock-index futures on stock market volatility. The researchers have used differing definitions and criteria for volatility, different time periods and data sets, and different research hypotheses.

The policy debate has been shaped by a bitter battle for market share between the futures and stock exchanges and by rivalries between their respective federal regulators. . . .⁸² The SEC has generally maintained that the presently inadequately regulated use of stock-index futures threatens stock market stability, and wants these products under its own jurisdiction (see ch. 9).⁸³ The CFTC, nearly always defensive of the industry it regulates, denies that there is any causal relationship between stock-index futures and stock price volatility. Alan Greenspan, Chairman of the Federal Reserve Board (FRB), said that the FRB was concerned “about what seems to be a higher frequency of large price movements in the equity markets, but he was “not convinced that such movements can be attributed to the introduction of stock-index futures and the opportunities they offer for greater leverage.”⁸⁴

As already noted, this debate is made more heated because many people in the general public, and many small investors, view the use of derivative products in general and stock-index futures in particular as merely gambling. They argue that this gambling increases the velocity of trading in the underlying stocks and increases the risks borne by other market participants.

⁷⁸Al McGartland and George Wang, “The Effects of Stock Index Futures on Cash Market Volatility: An Empirical Study,” Staff Working Paper #89-3, Commodity Futures Trading Commission April 1989.

⁷⁹Dean Furbush, “Program Trading and Price Movements Around the October 1987 Market Break” Office of Economic Analysis, U.S. Securities and Exchange Commission, May 9, 1989, p. 35.

⁸⁰Lawrence Harris, George Sofianos, and James E. Shapiro, “Program Trading and Intraday Volatility,” New York Stock Exchange Working Paper 9003, March 1990.

⁸¹Chen-Chin Chu and Edward L. Bubnys, “A Likelihood Ratio Test of Price Volatilities: Comparing Stock Index Spot and Futures,” *The Financial Review* 25, No. 1, February 1990, pp. 81-94.

⁸²Haraf, *op. cit.*, footnote 63.

⁸³Former SEC Chairman Ruder told Sen. Proxmire that the existence of these products, “. . . may encourage additional trading in the equity markets, with a resultant increase in intra-day volatility.” Letter to Sen. William Proxmire from SEC Chairman David S. Ruder, Mar. 30, 1988, reprinted in *Black Monday, the Stock Market Crash of October 19, 1987, Hearings before Senate Coremittee on Banking, Housing, and Urban Affairs, 100th Cong., 2d sess., 1988*, pp. 515, 516.

⁸⁴Testimony before the Subcommittee on Securities of the Senate Committee on Banking, Housing, and Urban Affairs, Mar. 29, 1990.

Whether there is or is not a fundamental difference between buying stock and buying stock-index futures, this difference in perception has direct political/economic implications. It has led to demands that stock-index futures and options should be abolished by regulation, or that at a minimum their trading should be discouraged (perhaps by higher margins or by a substantial tax on short-term investments, or by requiring transfer of stock rather than the much less expensive current method of cash settlement).⁸⁵ The debate over stock-index futures has recently shifted grounds, to the issue of which regulatory agency (the CFTC or the SEC) should regulate stock-index futures. This issue is explored in chapter 9.

MARGINS

In futures markets, financial integrity is bolstered by a system of margins, defined by the industry as a security deposit, or performance bond,⁸⁶ the purpose of which is to make sure that the futures market participant will be able to meet the obligations embodied in the futures contract. Futures margins have two elements, initial margin and variation margin. Initial margin is paid in advance, by anyone entering either a buy order or a sell order. It remains on deposit at a clearing firm (or is passed through to a clearinghouse) while the contract is open. It might be, for example, 5 percent of the face value of the contract, but this requirement changes from time to time. A futures customer must deposit additional funds if the equity in his account falls below a maintenance margin level, to bring it back up to the initial margin level.

Variation margin must be paid to cover losses on a daily, pay-as-you go basis. This is called "marking-to-market," and it is done twice daily and more often during periods of significant market swings. Thus to maintain a futures position, a customer must have on

deposit an amount equal to at least maintenance margin, and must be able to pay out in cash 100 percent of all losses daily. (They may also withdraw their gains.)

The level or amount of the initial margin is set by the futures exchange, and is intended to be high enough to protect against contract nonperformance, but low enough to make futures contracts very economical for the user. It has typically been 5 percent or less of the face value of the contract,⁸⁷ and for the market professionals it is typically much lower, about 3 percent, especially at the CME and CBOT

The subject of futures margins has sporadically been controversial, and since the 1987 market crash it has again been hotly debated. This issue, like that of dual trading, is not directly related to information technology. Yet information technology, by facilitating the linking of futures markets and stock markets and by encouraging portfolio trading, has given new life and new urgency to the issue.

The issue involves the level at which futures margin requirements are set. This controversy follows much the same industry and jurisdictional lines as that about the use of stock-index futures. Some policymakers and financial experts believe that low margins allow speculators to hold large open positions with relatively small amounts of money (i.e., high leverage). This, they reason, may cause excessive volatility in futures markets, and that through inter-market arbitrage and other less direct effects this volatility is extended to stock markets. This concern is most acute in the case of margins on stock-index futures. These critics usually argue that futures market margins should be raised, to a level that is more consistent with margins in stock markets.⁸⁸ They often argue also that the locus of responsibility for setting margin requirements

⁸⁵Allen B. Paul, "The Role of Cash Settlement in Futures Contract Specification," *Futures Markets: Regulatory Issues*, Anne E. Peck (ed.) (Washington, DC: American Enterprise Institute, 1985).

⁸⁶"Open positions in futures represent legal obligation either to make or take delivery, and margins are security deposits—a performance bond—intended to ensure performance on the contract. . . . Since most initial positions in futures are canceled by taking opposite positions rather than by delivery and since both short (a sale) and long (a purchase) positions are margined, it should be clear that the margins are not downpayments." William G. Tomek, "Margins on Futures Contracts: Their Economic Roles and Regulation," *Futures Markets: Regulatory Issues*, Anne E. Peck (ed.) (Washington, DC: American Enterprise Institute, 1985), p. 144.

⁸⁷In May 1990, the CME was requiring speculators to post \$9,000 initial margin and hedgers \$4,000. In July, as this report went to press, initial margin for speculators was \$22,000 and for hedgers \$8,000. (Margin requirements change frequently.) When the index is at 350, a stock-index future contract is worth \$175,000 (350 x 500, the S&P multiplier), and the initial margins are set at \$9,000 and \$4,000, the margins would be 5.1 and 2.2 percent, respectively.

⁸⁸In stock markets, margins are defined as downpayments on stock purchases (the seller pays no margin, in contrast to futures markets); the required level is set by the Federal Reserve Board, and has been 50 percent since 1974, but much less for specialists. Options margin requirements for broad-based stock-index options were raised after the 1987 crash to premium plus 10 percent (from 5 percent) and raised again to 15 percent in May 1988.

should be changed, the assumption being that so long as requirements are set by the exchanges (or their clearing organizations) they will remain too low.

The futures industry (and the CFTC, which oversees but does not directly determine margin levels except in emergency situations) counters that futures margins are fundamentally different in purpose and function from margins in securities markets; that they are and have been consistently proven to be adequate to protect the financial integrity of the markets and their participants; that they have no demonstrated adverse effects on levels of volatility; and that low margins are desirable to increase market liquidity. Futures margins levels are supposed to be determined by the level of volatility (indicating risk) in the market. Both buyer and seller deposit margin to guarantee performance of the contract.⁸⁹

The longer time to settlement in stock markets, and the fact that stock margins are not “marked-to-market” justify some difference in absolute levels of funds required. The industry’s premise that stock and futures margins are “fundamentally different” is questionable.⁹⁰ More pragmatically, the concept that futures margins need only protect futures clearing organizations and do not effect other markets, is questionable. After the 1987 crash, then

SEC Chairman Ruder, among others, suggested changing margin requirements in order to “limit leverage in the futures markets” and control market velocity. He cited SEC staff findings that the “illusion of liquidity” in futures markets and the use of stock-index futures as surrogates for stock basket positions pushed up stock prices and thus led to their drastic readjustment.⁹¹ The Brady Report also recommended that margin requirements be ‘harmonized between the equity and derivative markets.’⁹² The Katzenbach report (for the NYSE) made a similar recommendation.⁹³

Among those who have called for harmonized (or for higher) margins on stock-index futures since the 1987 market break are Congressmen, securities exchange officials, other representatives of the securities industry, and securities law practitioners.⁹⁴ These recommendations were based on the reasoning that when futures prices begin to fall and there are margin calls during the day, investors may sell stock to meet those calls, thus transferring stress to the stock market. There are strong differences of opinion about this. The futures industry and CFTC point out that during the crash the largest sellers of futures were pension funds which held large inventories of stocks and could have sold them to meet

⁸⁹If at maturity of the futures contract, the buyer wishes to take possession of the underlying asset the total cost of the asset must be supplied. However, stock-index futures cannot be settled by taking possession of the stocks in the index. For more information, see Hans R. Stoll, “Margins on Stock Index Futures Contracts,” Chicago Mercantile Exchange Working Paper No. 89-21, Oct. 2, 1989, p. 1.

⁹⁰For example, Professor James Gammill of the Harvard Business School has reproved the futures industry for its insistence that “‘Stock margins are down payments but futures margins are not.’ I believe that nothing beats this slogan for creating confusion about margins on the part of policy-makers and analysts who are not familiar with financial markets. The main source of the communication problem is the fact that the term ‘margin’ is sometimes used as shorthand for ‘margin account equity,’ while other times it is used as shorthand for ‘margin requirement.’ (And neither use of the term ‘margin’ is directly analogous to a down payment.)” James F. Gammill, Jr., “The Case for Federal Regulatory Oversight of Futures Margins,” in Proceedings of the Fall Research Conference on Regulatory Issues in Financial Markets, *The Review of Futures Markets*, vol. 7, No. 3, Washington DC, November 1988. The final sentence in the quotation is, in the original, a footnote to the preceding sentence.

⁹¹SEC Recommendations Regarding the October 1987 Market Break: Testimony of David S. Ruder Before the U.S. Senate Committee on Banking, Housing and Urban Affairs (Feb. 3, 1988), pp. 7-8 and 14-15. Commissioner Edward H. Fleischman reaffirmed in 1988 the SEC’s position that margins on futures and options should be increased to increase investor confidence, to decrease speculation in futures and options, and to reduce the illusion that the futures and options markets provide sufficient liquidity to allow quick portfolio liquidations in large amounts. See Panel Discussion on Regulatory Issues Facing the Futures Industry, Chicago Board of Trade, *The Review of Futures Markets*, vol. 7, No. 1, May 1988, p. 202.

⁹²Report of the Task Force on Market Mechanisms, May 5, 1988, pp. 64-66.

⁹³Nicholas Katzenbach, *An Overview of Program Trading and Its Impact on Current Market Practices*, December 1987, p. 31.

⁹⁴A sampling includes: Rep. Edward Markey, Subcommittee on Telecommunications and Finance, House Energy and Commerce Committee, in hearings July 14, 1988, and press release, May 4, 1989; Arthur Levitt, Chairman of the American Stock Exchange, writing in *The Washington Post*, July 12, 1988, A23; John L. Watson, President of the National Security Traders Association in a letter to the SEC Division of Market Regulation, Mar. 10, 1988; George L. BaChairman of Prudential-Bache Securities, in testimony before the Senate Finance Committee, May 11, 1988; Peter Buchanon, President of The First Boston Corp., in a letter to the Chairman of the NYSE, Jan. 29, 1988; Jeffrey B. Lane, President of Shearson Lehman Hutton, in testimony before the Subcommittee on Telecommunications and Finance, House Energy and Commerce Committee, July 14, 1988; Philip Purcell, Chairman of Dean Witter Financial Services Group, Inc. letter to the Chairman of the SEC, Feb. 24, 1988; Felix Rohatyn, Partner, Lazard Freres, in testimony before the Subcommittee on Telecommunications and Finance, House Energy and Commerce Committee, July 14, 1988; Stanley B. Shopkorn, Vice Chairman and Managing Director, Salomon Bros., at a Center for National Policy Symposium on Mar. 8, 1988; Thomas A. Russo, Partner, Cadwrdader, WickerSham & Taft, in testimony before the Subcommittee on Telecommunications and Finance, House Energy and Commerce Committee, May 3, 1990.

even higher margin calls;⁹⁵ CFTC analysts say that some pension funds use as margin their significant cash or cash-equivalent holdings and would have no need to sell stock, which in any case would take 5 days for clearing and settlement. By contrast, many individual speculators were net buyers of futures during the crash, but might have been forced to liquidate by higher margin requirements. The CFTC chairman claims that ‘margin call sell-off’ was not a factor in the crash.⁹⁶

„ A Federal Reserve analysis, however, notes that . . . speculators will shift to markets where initial margin requirements are effectively lower,’ and thus “excessive volatility, as well as nonfundamental pricing, may be transmitted from one market to another.”⁹⁷

Again, empirical studies of the relationship between futures margin levels and stock market volatility reach conflicting findings and are in the aggregate inconclusive. Both sides of the debate can marshal some statistical evidence, depending on the times studied, the definition of volatility that is used, and the way the question is framed. Only a few empirical studies directly relate to this point; many of those sometimes cited deal with stock margin levels, but not futures market margin levels. G.A. Hardouvelis, who found a negative relationship between margin levels and volatility, and Hsieh and Miller, who claimed to have refuted this finding, both analyzed stock market margin levels.⁹⁸ G. William Schwert (University of Rochester) analyzed many factors thought to affect stock volatility and concluded that leverage has a relatively small effect on stock volatility, and there is no evidence from the

stock market that increasing margin levels would change volatility.⁹⁹ A CFTC study of events during the crash concluded that low futures margins “could not be shown to have contributed to excessive volatility.”¹⁰⁰

The debate on this issue, like that on stock-index futures and volatility, often reflects long-standing industry/agency positions. The CFTC holds that the margin on stock-index futures should be 28 to 29 percent as high as the margin on the underlying stocks (but also maintains that futures exchanges should set margin requirements without government interference).¹⁰¹ The President’s Working Group on Financial Markets reported in May 1988 that it ‘was not able to agree on whether or not it is appropriate or effective to raise margins above prudential levels in an attempt to reduce leverage or dampen velocity.’ Their report was specific about the disagreement; the SEC chairman wanted higher futures margins, while the CFTC chairman, the Department of Treasury representative, and the FRB chairman “do not believe that the evidence supports the conclusion that higher margins will reduce volatility,’ and were reluctant to raise them because this would increase transaction costs and “could have a negative effect on market liquidity and efficiency, possibly increasing volatility and risking the movement of futures trading into off-shore markets.’ After the Working Group’s report the futures markets subsequently reduced their margin requirements, to levels below those at the time of the crash.

By 1990, this line-up was changing. Secretary of the Treasury Nicholas Brady had chaired the President’s Working Group and had acquiesced in its

⁹⁵Many pension funds (and other institutional investors), however, had short futures positions and had no margin calls as the market fell.

⁹⁶“ . . . An examination of the magnitude of open interest in the S&P 500 stock-index futures contract on high volatility days contradicts the supposition that margin call sell-off exacerbated the market decline. On both Oct. 19, 1987, and Oct. 13, 1989, open interest at day’s end was higher than on the previous day—more positions were opened than were closed.” Wendy L. Gramm, Ph.D., statement before the Securities Subcommittee of the Senate Committee on Banking, Housing, and Urban Affairs, Mar. 19, 1990.

⁹⁷Arturo Estrelia, “consistent Margin Requirements: Are They Feasible,” *Quarterly Review*, Federal Reserve Bank of New York, vol. 13, No. 2, summer 1988, pp. 69.

⁹⁸G.A. Hardouvelis, “Margin Requirements and Stock Market Volatility,” *Federal Reserve Bank of New York Quarterly Review*, 1988, pp. 80-89. David A. Hsieh and Merton H. Miller, “Margin Regulation and Stock Market Volatility,” Graduate School of Business, University of Chicago, April 1989. Hardouvelis tested the historical effect of stock market margins on volatility, and concluded that margins are related inversely to volatility and low margins are associated with speculative bubbles. Kusark and Salinger, in two separate working papers for the CFTC, reexamined Hardouvelis’ study. Kusark said that its regressions were unstable and biased both by the pre-1945 time period that was included and by the method of calculating volatility. He concluded that margins had no effect on volatility. Salinger concluded that Hardouvelis’ thesis did not hold up regarding the bull market of the 1920s—low margins did not cause it.

⁹⁹G. William Schwert, “why Does Stock Market Volatility Change Over Time?” GPB 87-11, May 1988, and “Stock Volatility and the Crash of ‘87,” BC 89-01, January 1989, General Working Papers: Bradley Policy Research Center, University of Rochester.

¹⁰⁰McGartland and Wang, op. Cit., footnote 78.

¹⁰¹Wendy L. Gramm, CFTC Chairman, in a statement to the Subcommittee on Telecommunications and Finance of the House Energy and Commerce Committee, May 19, 1988. Chairman Gramm said that margin on stocks should be roughly 3.5 times higher than the margin on stock-index futures.

findings, although the 1987 President's Task Force which he had also chaired, had called for harmonization of margins across the markets. However, Brady later announced that he intended to ask the Working Group to reconsider the issue, because "there is a public interest involved beyond the private interest of the exchanges."¹⁰²

Debate about the appropriate level of futures margin usually becomes debate about where the ultimate responsibility for these decisions should lie: in the private sector, as it does now or in a regulatory agency? If the latter, should it be the SEC (which does not set stock margin requirements, but wants higher futures margins), the FRB (which does set stock margin requirements, but does not currently want the responsibility for futures margins), or the CFTC (which has generally favored leaving this responsibility with the futures exchanges, and has generally defended low margins)?

On the issue of futures margins, and who should determine their levels, the two U.S. regulatory agencies disagree. The CFTC has consistently affirmed the futures industry's position that futures margins are fundamentally different from securities margins, that they should be kept low and flexible, and that as a policy tool, margin regulation is "poorly adapted to controlling or even limiting volatility."¹⁰³ Higher margins might reduce the activity of speculators, leaving the markets without liquidity. The agency position has been that there is no need for regulatory control of futures margin levels, either by CFTC or other Federal authorities.¹⁰⁴

When stock-index futures were first proposed in 1979, the FRB asserted that it had the authority to impose margin requirements, and would do so, on the grounds that the proposed contract would be a functional equivalent of stock-index options and therefore should be subject to equivalent regulation and margin requirements. The FRB's responsibilities are broader than those of the SEC and the CFTC;

its mandate includes caring for the stability of U.S. financial markets generally. In this context, the FRB may have considered assuming responsibility for stock-index futures margin requirements as another kind of credit control. After the futures exchanges set higher margins for the index futures contracts than those for other kinds of futures, the FRB did not insist on setting margin levels, and it has not renewed its claim to responsibility.

Congress has several times considered the possibility of futures margin regulation as a potential policy instrument to restrain market behavior and to protect naive investors. For example, in 1974 when the CFTC was created, in 1980 after a silver market scandal, and after the 1987 market crash there were proposals to authorize either the CFTC or the Federal Reserve Board to set futures margins. With the development of financial futures, and especially stock-index futures, this interest in margin requirements focused especially on the issue of parity of regulation of margins among futures, options, and stocks.¹⁰⁵

Margin requirements may have different functions in futures markets and in securities markets, but they have two common purposes in both markets when viewed from a public policy perspective: protection of the integrity of the markets, and control of excessively speculative activity.¹⁰⁶ Margins limit the credit risks of individual participants, primarily not to protect those participants but to insure that in times of stressed markets, cascading failures could not in the aggregate cause the breakdown of the market as a whole. The question is whether harmonization of margin levels-or "consistency in margin requirements across equity-related markets"—would achieve those two objectives. In this case, "consistency" could mean allowing the various parameters of margin requirements (i.e., initial, maintenance, and variation margins, posting periods, exemptions) to be set at different levels, but in such a way that the probability of default are about the same in each market.

¹⁰²Testimony before the Senate Committee on Banking, Housing, and Urban Affairs, Oct. 26, 1989, p. 12.

¹⁰³Andrea M. Corcoran (Director of the CFTC's Division of Trading and Markets), "Aftermath of the Crash: Policy Assessments, Public Perceptions, and Prospective Reforms," a speech for the Japan Center for International Finance, 1988.

¹⁰⁴Gramm, *op. cit.*, footnote 101; Corcoran, *op. cit.*, footnote 103.

¹⁰⁵William G. Tomek, "Margins on Futures Contracts: Their Economic Roles and Regulations," Anne E. Peck (ed.), *Futures Markets: Regulatory Issues* (Washington, DC, American Enterprise Institute, 1985), p. 195.

¹⁰⁶This formulation draws on that of Arturo Estrella, Federal Reserve Board analyst, in "Consistent Margin Requirements: Are They Feasible?" *Quarterly Review*, Federal Reserve Bank of New York, vol. 13, No. 2, Summer 1988, pp. 61-79. Estrella concludes that if speculation is a real issue, the consistency of at least initial margins should be seriously considered.

The Bush Administration has asked that authority to regulate stock-index futures be transferred, which presumably would transfer responsibility for their margin requirements either to the SEC or to the FRB, which is responsible for stock margin requirements. This issue is discussed in chapter 6.

PREPARING FOR THE FUTURE

Two Chicago futures exchanges have recognized the challenge posed by the strong movement toward international trading.¹⁰⁷ The CME and the CBOT are developing an electronic system for “24-hour trading,” or the execution of transactions at a geographical distance or outside of trading hours of local markets. CME and CBOT are taking the calculated risk that their own automated systems for off-site trading, if successful, may eventually put out of business their traditional form of market, the “open outcry” or pit auction system. They may recognize the likelihood that if they do not take the lead, others outside the industry will do so.

Foreign futures exchanges have begun to compete directly with U.S. futures exchanges. There are futures exchanges in Auckland, London, Paris, Frankfurt, Zurich, Hong Kong, Tokyo, Singapore, and Sydney. When they began to offer their own local versions of U.S. contracts, investment firms were able to offer these products to customers without regard to trading hours in the United States, the threatened U.S. exchanges took action.¹⁰⁸ They first attempted to meet this competition through mutual offset agreements,¹⁰⁹ e.g., one between The Chicago Mercantile Exchange (CME) and the Singapore International Monetary Exchange (SIMEX) for Eurodollar and foreign currency contracts. CME/SIMEX was successful, although only marginally so. Another response was to lengthen trading hours; for example, CBOT began both an earlier opening (7:20 a.m.) and an evening session.

In September of 1987, the CME announced that it would develop—together with Reuters—an electronic futures and futures-options trading network,

the Post (Pre) Market Trade System, later renamed GLOBEX for “global exchange.” CME members accepted the idea, with the assurance that GLOBEX was strictly an off-hours system, and in return for receiving a portion of the revenues generated by GLOBEX.¹¹⁰

In early 1989 the CBOT unveiled plans for another off-hours global system, “AURORA.” While the GLOBEX system is an automatic order matching system, AURORA attempted to emulate the traders in the pit with icons (symbols) that allow traders to select the counterparts to their trade. The CBOT claimed that AURORA would capture “all of the economic advantages of the auction market combined with the advantage of the ability to conduct trading from any location in the world.”¹¹¹

There were complaints from the financial futures community about the need to install two terminals, and CME and CBOT announced they would consider merging the GLOBEX and AURORA development efforts. While sporadic negotiations continued, development proceeded independently on each system for over a year. In May 1990, the two exchanges announced that they had agreed to merge GLOBEX and AURORA. The details of this plan are not yet worked out. It is possible that AURORA will become an optional user interface with the GLOBEX system.

The network will be an interactive data communications network linking individual user terminals with a central computer at Reuters. It will operate only after normal U.S. hours of trading and will link investors in North America, Asia, and Europe. GLOBEX adjusts the timing of all bids and offers to equalize for distance; i.e., the speed with which they are posted depends on the transmission time for the most distant trader active at that time. For entry of orders, trader terminals consisting of keyboard, monitor, and printer will be located in the offices of CME clearing members and individual members (including overseas members) who are qualified and backed by a clearing member. (See ch. 6 for an

¹⁰⁷See OTA's background paper, *op. cit.*, footnote 6.

¹⁰⁸Karen Pierog, “How Technology Is Tackling 24-Hour Global Markets,” *Futures*, June 1989, p. 68.

¹⁰⁹“Offset” (in this context) means that one can open a position in one country and close it in another, and pay only one brokerage fee.

¹¹⁰The rights conferred by membership in CME, or “a seat,” are to be divided into access to pit trading and access to trading through GLOBEX. Members will have the right to “lease” one of these rights; e.g., a pit trader can lease to someone else, presumably overseas, his access to GLOBEX, thus generating additional income. If GLOBEX (or other electronic trading systems) comes to dominate futures trading, the increase in value of their access to it will presumably compensate the pit members for this competition.

¹¹¹“AURORA—EOS,” promotional literature distributed by CBOT.

explanation of the responsibility of clearing members.) Administrative terminals, in the offices of clearing members only, would also receive confirmations of all trades resulting from orders entered into associated trader terminals. The terminals will display the 10 best bid and 10 best offer prices, along with the quantity bid or offered; the last sale price, and other data.

Reuters will provide the computer hardware and software and also make available other Reuters' services (e.g., news and cash market quotations) through GLOBEX terminals. CME will determine

the instruments, and the rules and procedures for trading, and will provide clearing facilities, auditing, compliance, and market surveillance. Despite Reuters being a British company, the joint effort is largely seen as a globally strategic move for the preservation and enlargement of the U.S. position in commodities and financial futures trading. It may also be a harbinger of global 'floor-less' trading in the future. It is significant, however, that Reuters has recognized the value of partnership with an organized and regulated marketplace, the exchanges.